

2009

Sustainability and Changing University Culture and Curriculum: A Grand valley State University case Study

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Abstract

In the past two decades the higher education cultures in many countries have embedded significant changes in understanding the role of sustainability. While many universities and colleges in the United States have embraced this concept as the major driver of environmental, social, economic and technological progress, only a few programmes offer undergraduate or graduate degrees in sustainability studies or sustainable development. Recently, however, interdisciplinary scholarship on the role of sustainability in higher education has been boosted by research and public debate on global climate change, globalisation and free trade. Nevertheless, some US universities still do not consider sustainability as a serious priority in scholarship and curriculum, focusing primarily on campus operations and facilities. This paper contests this simplistic approach and argues that it represents only the first step in building a truly sustainable community on campus.

Grand Valley State University (GVSU) believes that sustainable campus facilities and routine campus operations can be effectively used as powerful resources for interdisciplinary research and hands-on problem solving education. In 2004 GVSU created a Sustainability Initiative which aimed to bring together student, faculty, facility and community groups to create awareness and gain momentum in campus and community sustainability. This paper outlines the engagement of groups and their activities. Student activities include: the production of a student sustainability guide for all first years, living centre energy conservation competitions, student internships with businesses interested in sustainability, campus sustainability week and a host of other student activities. Facility activities embrace a wind energy study, energy efficiencies, recycling practices, food service sustainability and LEED buildings. Faculty and curriculum goals cover research, outreach service, teaching sustainability in the classroom and academic programmes such as environmental studies, the sustainability certificate and establishment of a faculty sustainability consortium. Furthermore, community partnerships have been nurtured where the university serves as a catalyst. In all cases, GVSU seeks to demonstrate enhancement in value arising from engagement with the framework of sustainability.

Keywords United States, sustainability, curriculum, campus culture, higher education

Introduction

The Talloires Declaration (signed in France in 1990) agreed to increase awareness of environmentally sustainable development, create an institutional culture of sustainability, educate for environmentally responsible citizens, and foster environmental literacy for all. Over 315 universities world-wide, including more than one hundred in the United States, have subscribed to The Declaration that claims

that 'universities educate most of the people who develop and manage society's institutions. For this reason, universities bear profound responsibilities to increase the awareness, knowledge, technologies, and tools to create an environmentally sustainable future'.

Grand Valley State University (GVSU) mission is educating students to shape their lives, their professions and societies. As a leader of higher education in West Michigan, the university bears profound responsibilities to increase the awareness, knowledge, technologies and tools to create an environmentally sustainable future. However, like many other US campuses, the conscious awareness of sustainability is a relatively recent phenomenon at Grand Valley. Since 2004 GVSU has been actively engaged in building its new Sustainability Initiative and published the first Sustainability Report in October 2005. That report addresses all three areas of the triple bottom line (TBL), including social, environmental and economic indicators of sustainable development and utilises 64 sustainability indicators or metrics:

The university is a microcosm of the larger community, and the manner in which it carries out its daily activities is an important demonstration of ways to achieve environmentally responsible living. By practising what it preaches, the university can both engage the students in understanding the institutional metabolism of materials and activities, and have them actively participate to minimize pollution and waste. (Talloires Declaration, 1990)

Driven both by student and faculty demands, the past three years have been a time of dramatic changes in understanding of the role of sustainability in GVSU curriculum, campus culture, research policies, operations, student life, and community outreach. This paper summarises some major steps in this direction, success stories, lessons as well as some major challenges presented to the creation of a truly sustainable campus model at GVSU.

Importance of Sustainability for Grand Valley

Grand Valley State University is situated in Allendale, Michigan, home to Grand Valley's main campus, established in 1960, and situated on 1,237 acres, 12 miles west of Grand Rapids. Classes are also offered at the University's Pew Campus in Grand Rapids (15 miles away), Meijer Campus in Holland (20 miles), and through centres at Muskegon (40 miles) and Traverse City (150 miles) established in cooperation with local community colleges. Enrolling 23,500 students, it has been the fastest growing comprehensive university in the state for over ten years. Located in west Michigan, near Lake Michigan, it enjoys access to water resources, agriculture, and recreation and is situated within a regional population in excess of one million.

As the university grows, its social, economic and environmental impact on the region is substantial. Six hundred million dollars (US) of economic value is attributed to the university, and over 80% of the graduates remain in the region. Like any community, Grand Valley seeks to create lasting value to the region, students and environment. Sustainability becomes an essential part of the mission of 'Educating students to shape their lives, their professions, and their societies. The university contributes to the enrichment of society through excellent teaching, active scholarship, and public service'. Grand Valley, therefore, seeks to become a model community of sustainability through its actions and role in education.

Development of Sustainability at Grand Valley State University

In July of 2004 Grand Valley began to engage in the development of sustainability across a wide range of campus activities. The Sustainability Initiative was launched; a programme headed by Mr. Norman Christopher, and was given the directive to produce Grand Valley's first Sustainability Indicator report. This report outlined the key markers for sustainability performance on the campus. Compilation of the report provided the impetus to bring together Deans, facility managers, food services and other key players in campus activities. Following the completion of the report in 2005, several teams were created. First, an advisory group of Deans, managers and key faculty began to meet quarterly to discuss strategic planning. A smaller tactical team comprising the Sustainability Director, Facilities Director, Student Senate President and the Associate Dean of Interdisciplinary Studies met to plan key strategies. Lastly, a group of faculty form an 'education for sustainability' team charged with piloting curricular changes through the faculty review process. Future plans include curriculum development, campus events, online and real time indicator reports, and a published strategic plan covering the next two years.

Sustainability in the design of all new campus buildings has become a leading topic. GVSU has made a commitment to energy efficiencies in newly-constructed buildings. Adhering to LEED (Leadership in Energy and Environmental Design) standards, and within the constraints of space (university founded in 1960), construction this year will exceed US\$100 million. New construction using green building materials and striving for LEED certification includes:

- (i) The Michigan Alternative and Renewable Energy Center - a LEED certified building, self-powered through the use of biofuels and solar energy. It is an incubator for alternative energy research
- (ii) Lake Ontario Hall - a LEED silver building for classes and offices uses the most up to date energy and water efficient designs
- (iii) Kennedy Engineering - a LEED building that incorporates rooftop gardens to reduce water run-off and help insulate the building
- (iv) New Construction - Indoor practice facility for sports; New Honors living centre (classes and living spaces for 1,000 students); building additions which use LEED design methods

Partnerships

Grand Valley has worked closely with the city of Grand Rapids (population 300,000) drawing organisations, businesses and other educational institutions into a partnership dedicated to promoting sustainable practice. The Community Sustainability Partnership (www.grpartners.org) which holds quarterly summits to discuss sustainable practices related to the Triple Bottom Line is making progress towards purposeful change in the region. Partnerships are now forming in other communities and the intention is to develop a west Michigan regional partnership serving the million-plus population. The university has committed both to Education for Sustainability, by the President's signing of the Talloires Declaration, and carbon neutrality, as evidenced by the signing of the ACU President's Climate Commitment in 2007.

Operations

Energy savings

As the fastest growing university within the state of Michigan, GVSU casts a large footprint and expends vast resources. Recent campus efforts are focusing on improving energy efficiencies to hold down cost increases. Purchasing bulk fuel and electricity has enabled Grand Valley to reduce natural gas costs per square foot whilst water consumption has remained stable. Bulk purchasing efforts are being expanded to include office materials, paper and other expendables.

To improve efficiency Grand Valley has installed, recently, a new boiler which re-uses heated air within the system. Cost savings will pay for the improvement within three years. GVSU has also recently completed a wind analysis project where wind velocity readings are obtained across the campus. The goal is to determine whether GVSU can augment its electricity use, specifically for edge-of-campus facilities that pay a higher rate for electricity. In 2007, Grand Valley is investing US\$1.0 million on various energy efficiency projects. Facilities is investing US\$25,000 to initiate a CFL bulb replacement programme where incandescent bulbs are exchanged for compact fluorescent bulbs. Energy savings should pay for the cost of the replacement within a few years.

With almost 90 campus buildings, a switch to 'green' cleaning products will further reduce environmental impact. Currently Facilities is testing floor polishes and cleaning solutions that are environmentally sound. Floor polishes have been adopted that are more durable and require less frequent stripping than conventional polishes. Grand Valley has formed a partnership with Nichols (<http://www.enichols.com/>), a supplier of cleaning products and member of the Community Sustainability Partnership (<http://www.grpartners.org/>) which has funded two scholarships in Sustainability for Grand Valley undergraduate students.

Transportation

A bus ridership programme has been initiated as a joint venture between GVSU and the city of Grand Rapids. Grand Valley has two campuses, the Allendale main campus and a downtown Grand Rapids campus, 15 miles away. Buses run every six minutes, and use has grown exponentially since the programme began in 2000. Estimated gasoline savings in 2005 alone were 550,000 gallons costed at US\$2 million. Recently, the city and Grand Valley have purchased two hybrid buses which help to greatly improve energy efficiency and help meet the daily demand of over 7,000 riders. Additional savings both by students and GVSU reduced the demand for downtown parking passes (at a cost of US\$120) as well as negating the need to build additional downtown parking. Campus facilities have also purchased plug-in electric maintenance vehicles and more energy efficient lawn mowers in an effort to further reduce the carbon footprint. A preliminary study has been completed to examine Grand Valley's carbon footprint, with additional work scheduled in estimating transportation impact (air travel, commuting) and carbon offset by the natural surroundings (tree survey).

Water

Water saving is very important to Grand Valley. Situated 20 minutes from the Great Lakes, water conservation and water quality is essential for maintaining a sustainable environment. New LEED buildings, with waterless urinals and low volume toilets reduce water use by over 70%. Grand Valley has a retention pond in the centre of campus to help capture storm water run off; however, water run off is a serious problem for Grand Valley, as it is situated along high ravines that line the adjacent Grand River. Increased run off has already contributed to local ravine erosion. Future plans to combat the storm water problem include additional holding ponds, rain gardens, porous pavement for parking lots, increased native plantings, rain meters on irrigation systems and a change in mowing practices along the ravine edges to reduce water run off.

Recycling

Michigan lags behind the nation in its recycling efforts. Grand Valley also struggles with recycling participation, with only 24% of materials recycled. Efforts are underway to improve recycling on campus. Recycling locations are expanding and being made more visible. An area where Grand Valley is taking the lead is on the use of recycled materials. The bookstore has switched its paper purchase to recycled paper. While the initial cost is slightly higher, the environmental impact (water use) is reduced. Food service has now switched almost entirely to recycled products, including cups, napkins, utensils and other packaging. The shirts worn by employees are made from hemp, purchased from a local sustainable clothing vendor. Food services also purchase farm produce from local vendors. Future plans include composting and growing food on campus gardens.

Facilities is trying to encourage students on-campus to think more responsibly about discarded possessions at the end of the year. Project Donate is designed to allow students who would normally discard beds, appliances and other living items to donate via specially designated dumpsters for sorting and distribution to agencies and those in need. In 2007, over 25 metric tons of items were so donated.

Community garden

Project planning has started for nearby farm land recently purchased by Grand Valley to provide for future overflow construction projects and joint community and campus use as a community garden. Facilities plans to use some of the land as a campus tree nursery while food services propose to grow food and develop a site for composting food waste.

Students

Students at Grand Valley have become significant drivers of the sustainability agenda on-campus. They have a strong history of volunteerism and community activity. Sustainability is proving to be a cause uniting student groups around a common theme. This year the Student Senate will be hosting a series of meetings and dinners for over 20 student groups having a tie to sustainability. The Senate President's goal is to create a student coalition that pools resources to impact sustainability on-

campus. In addition, the Student Senate crafted a resolution in 2007 supporting the creation of a Sustainability Certificate programme which faculty will develop in the Fall.

Sustainability guidebook

In 2006, students and the Director of Facilities at Grand Valley teamed up to create the first Sustainability Guidebook. The small booklet described what sustainability is and how students might become involved. In 2007, students revised the booklet, added information on what can be done to reduce, re-use, and recycle. The attractive booklet was distributed at first year student orientation to 3,500 incoming freshmen. Orientation leaders were also provided with information on sustainability. The Guidebook continues to be successful and over 10,000 have been printed for 2007 (see http://www.gvsu.edu/cms3/assets/1ACDDEF0-A15A-67B1-F268BE06B2416593/sustainability_guide/StuSustainFinal.pdf).

Web page

In 2005, students working with the Director of the Sustainability Initiative (Mr. Norman Christopher) created a sustainability web page (<http://main.gvsu.edu/sustainability/>). The page, updated by student interns, contains information about sustainability-related courses, campus events, news articles, and opportunities for student participation. A faculty page has recently been added (see www.gvsu.edu/cois).

Student projects

Since sustainability is a new topic for local communities and businesses, Grand Valley students have been given rare opportunities to become involved in high level planning for some businesses. Recently, for example, when a local hospital wanted to produce a report on its sustainable practices and track key indicators it turned for assistance to Grand Valley. A senior business student, completing a two semester independent study, researched, interviewed key staff, and created an indicator report for the hospital. The hospital recently hired a sustainability coordinator to maintain the hospital's sustainability momentum. Other projects include assistance given to an area High School for underprivileged students in mathematics tutoring, mentorship and curricular help with art and design. Meanwhile, the university's Service Learning Centre has partnered local communities in need to help and linked students to sustainability-related projects. In addition, students are: assisting Campus Operations to establish the extent of the university footprint; conducting audits on transportation costs for the hybrid buses; and calculating estimates for campus-wide green-house gas emissions. Facilities will continue collaboration with students in the collection of data related to energy conservation. In addition, students from the School of Nursing work with low income and disadvantaged school children whilst nursing students visit schools and provide, on-site and free of charge, basic health care services.

Students are widely involved in promoting sustainability across the campus. Working with Campus Operations, Food Services, and the Sustainability Initiative students are helping to host Campus Sustainability Week. Held during October and immediately prior to Make a Difference Day, the three day event hosts speakers, music, fair trade food and demonstrations such as a 'green' living space. Each day focuses on one of the three aspects of the 'Triple Bottom Line' (environmental stewardship, economic prosperity, social justice). The event is designed to involve faculty and their classes.

In addition student living centres are becoming more involved with sustainability. Energy competitions were held across campus during 2006 and 2007. Buildings were told to reduce electricity use as the competition goal. Living centres reduced usage in one month by 120,000 Kwh, enough energy to power 234 homes for one month. Cost savings exceeded US\$15,000. Future activities will be extended to faculty and staff buildings.

Faculty and Staff

Getting Faculty together

In the spring of 2007, the Associate Dean launched a faculty listserv for sustainability and invited the campus community, faculty and community members to join. Faculty identified on campus as participants in any event or activity relating to sustainability were targeted. To date, 30 members comprise the listserv, with 20 more faculty identified as having an interest in sustainability. In the spring information was sought from faculty about personal research related to sustainability. As is often the case, many faculty are unaware of the activities of colleagues in other departments. The intention is to encourage sustainability research across disciplines that provides greater value to the university community.

Starting in the Fall 2007, an internal grant has funded a 'teaching circle' to promote discussion on teaching sustainability in various classroom settings (disciplines). The goals of the teaching circle are to:

- (i) increase familiarity with sustainability
- (ii) generate case examples of sustainability issues that cross disciplines
- (iii) identify and gather interested faculty to underpin the development of a Sustainability Certificate programme
- (iv) compile material for an introductory text on sustainability

As part of an internal grant to promote the teaching of sustainability, Faculty are expected to read 147 *Tips on Teaching Sustainability*, and a website has been launched (see www.gvsu.edu/cois).

Faculty research

Sustainable development has become an important focus of faculty research at Grand Valley. Efforts have been made to facilitate communication among faculty and students and promote multidisciplinary collaboration. Faculty have been surveyed to devise a database of current research activities as the basis for stimulating collaborative work (see <http://www.gvsu.edu/cois/index.cfm?id=41BD8AA3-9683-8B58-805E66FBB2188DF6>).

Curriculum

The 2005 Indicator Report listed courses that covered aspects of sustainability. That list was expanded in 2007 to over 200 courses, including a hard core of 60 that were heavily focused on sustainability. These courses span a variety of disciplines. Many are part of the General Education curriculum while others are concentrated in specific majors. For guidance, students have been given access to a dedicated web site (http://www.gvsu.edu/cms3/assets/1ACDDEF0-A15A-67B1-F268BE06B2416593/NEW%20revised%20sustainability_Courses2007-08.xls).

In the summer of 2006, a group of GVSU faculty conducted a pilot study on the role of sustainability in the higher education curriculum in the US and Europe to identify best practices and criteria-based, bench-mark institutions. Faculty surveyed sustainability initiatives in the UK, Belgium and Spain and established a preliminary network for collaborative research on sustainability indicators.

Across campus, faculty are coming together to form interdisciplinary programmes that involve sustainability. An Environmental Studies Minor is being approved by the university curricular committees. In the Fall 2007, faculty will begin to work on a Sustainability Certificate programme and the possible inclusion of sustainability as a part of general education.

The Business College has seen the need for sustainability within its curriculum. Working with the Director of Sustainability, the College Dean co-taught a topics course 'Sustainable Business and Organizations' for MBA students. The class was very well-received and the business student advisory group has requested the College to develop coursework for undergraduate students. Discussions are underway between the Business College and the College of Interdisciplinary Studies to coordinate development efforts.

Engineering has identified a substantial need for training in sustainability. Engineering faculty now teach sustainable design practices in many classes. Students have helped design and build a 'green' home for a low income resident as a class project and have participated in design competitions related to energy efficiency and sustainable design. Student research projects in alternative energy (solar, wind), energy use tracking (i.e. bus system) and efficiency design now revolve around sustainability. A recent extension to the engineering building recently received LEED Silver rating for environmental design.

Initiatives for sustainability now arise spontaneously from faculty and staff. For example, information staff are pursuing best practices in sustainable printing and use paper and printing supply chains certified by the Forestry Stewardship Council (FSC). Another example is the campus bookstore selling re-usable shopping bags with half of the profit directed to the Sustainability Initiative. The international programme is initiating a tree planting programme to offset carbon use from air travel by the study-abroad programme. These examples demonstrate clearly the on-campus expansion of a stakeholder ownership of sustainability and growth of a positive culture.

Clearly, the momentum for education in sustainability is taking shape and accelerating in growth. The Sustainability Initiative, housed in the College of Interdisciplinary Studies, is uniquely positioned as the 'dot connector'. It provides the link between different disciplines making possible an integration of sustainability education across the university.

Outreach

Connecting Grand Valley to the local community is an important role of a regional university. In addition to its economic impact, Grand Valley offers an intellectual capital and service resource that can greatly benefit west Michigan. One key resource for the region is the Annis Water Resources Institute (AWRI) (<http://www.gvsu.edu/wri/>). AWRI is a research and education arm of Grand Valley, located on the shores of Lake Michigan. Conducting water quality studies for local communities as well as larger, grant-funded initiatives, AWRI is a vital resource for the Great Lakes region. In addition to research activities, AWRI maintains a fleet of two vessels and a laboratory for educational purposes. The boats take school children onto Lake Michigan to collect water samples for analysis in the laboratory. AWRI also provides training for educators on water quality experiments for the classroom. The Institute provides services to government and often testifies on water quality issues. It has received grant funding to host 'Café Scientific' sessions for the local community to discuss sustainability among interested community members and business owners.

The Lake Michigan shoreline is an unique resource for GVSU. The Michigan Alternative and Renewable Energy Center (MAREC) is the first fully-integrated demonstration facility for distributed generation of electricity using alternative and renewable energy technologies in the United States. As a LEED building, it is fully self-sufficient in energy generation. This energy Centre will create and attract new business to the region. MAREC is positioned to establish west Michigan as a leader in the application of alternative energy technologies - technologies that can be widely employed globally. In addition, MAREC ensures that Grand Valley State University will be a leader in developing interdisciplinary alternative energy education and product development programmes.

A 30 kW Capstone micro turbine has been installed and integrated with MAREC's advanced electric generating technologies that have operated continuously in the past 14 months: a 250 kW molten carbonate fuel cell (Fuel Cell Energy), a 30 kW photovoltaic solar roof tiles (Unisolar) and a nickel metal hydride battery (COBASYS). A Kane heat exchanger was integrated for exhaust gas heat recovery. In addition, in November 2007, MAREC will be hosting an Energy conference for local business to create strategies for business becoming involved in wind energy production.

From the perspective of social justice and education, Grand Valley has been active in establishing relationships with schools and non-profit organisations. The Sustainability Initiative, for example, was contacted by a local Alternative School, a school for students who are well below the margin in reading and mathematics. Moving these children towards graduation is a difficult task, and often the schools are under-funded. This school needed assistance in mathematics tutoring, visual and graphics arts instruction and creating a model for sustainability in practices. A partnership was created and key resources to assist the school were identified at Grand Valley. This partnership model can be extended to other schools and local colleges. Another example involves partnership with a school where 95% of

the students come from families living in poverty and without access to health care and personal transportation. In partnership, students from the nursing programme at Grand Valley benefit from visiting the school where they provide free basic health care and treatment. In addition, the College of Interdisciplinary Studies which houses the sustainability initiative has chosen poverty and economic justice as its theme for 2007-08, linking this initiative to broader programmes offered across campus.

Summary and Conclusion

Sustainability efforts at Grand Valley are becoming more visible with each passing year. Efforts are widespread and involve multiple entities. Rather than a top down management, the GVSU Initiative seeks to draw together stakeholders who will work in partnership to achieve its goals. Future plans include an analysis of the feasibility of achieving carbon neutrality, receiving a LEED Campus designation and enhancing green energy use. Grand Valley aims to be a model that communities and other Universities can look to for sustainable practice. With sustained links to the community and region, Grand Valley intends to become a centre of excellence in sustainability, one to which communities can look for guidance and achievement.

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